

### **REMARKS**

The above amendments and remarks are made to the put the above referenced application in condition for allowance. The pending claims are Claims 1-3, and 5. Claim 4 is canceled.

Corrections to the specification, corrected drawings and the addition of Figure 9 are to more accurately reflect what the Figures are. With respect to added Figure 9, it provides the formula of MPMP. This is not new matter as this identical subject matter is in the priority document (*see* Figure 17 therein). No new matter is introduced.

The Examiner's comments with respect to the drawings, specification and rejection of the claims are discussed separately below.

#### **Drawings and Specification**

Applicants wish to express their appreciation for the Examiner's observations regarding the description of the drawings at page 5 of the specification with respect to the Figures and other errors in the Figures. These errors have been corrected by the amendments herein. The specification has been further amended elsewhere to correct typographical errors and recitation of the various formulae. No new matter is introduced and all subject matter is redundant to that which is shown in the Figures.

#### **Claim Rejections – 35 U.S.C. § 112, Second Paragraph**

Claims 1 –5 were rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention for a variety of drafting errors including referring to Figures in the claims, but reciting to the location of such Figures in the specification and for a misunderstanding about the ring system in such compositions. These rejections have been overcome by the specific amendments herein that include providing the actual structures shown in the respectively referenced Figures in the claims. For clarification, use of referenced substituents are reflected in the amendment for the specified variables within the structures. Applicants respectfully submit that the proposed amendments address the Examiner's rejection and provides the clarification requested without introducing new matter.

In addition, Claim 1 was amended to recite a defined integer of 1-20 for n. Support for this amendment exists at page 6, line 4 of the Specification. Examiner's remarks regarding the use of the terms "heteroaryl" and "heteroalkyl" as being indefinite is traversed. These are well known terms of art. In particular, as illustrated by the attached definitions from *The Condensed Chemical Dictionary*, 7<sup>th</sup> Edition (Exhibit A hereto), definitions are provided for "alkyl", "aryl", and "hetero". Moreover, the terms "heteroalkyl" and "heteroaryl" are defined in the specification at page 3, line 11 and page 4, line 3 respectively. In view of the

amendment herein, where n is 1-20, it is believed that there is no indefiniteness to the pending claims.

Thus, Applicants respectfully request that this rejection should be withdrawn.

**35 U.S.C. § 102 (b)**  
**EP 0 564 224 (Nakada); Tetrahed. Lett. 40 (1999) (Dietrich-Buchecker); and**  
**US Patent No. 4,853,090 (Daniel)**

The pending claims were rejected are being anticipated by the above three cited references. In particular, Claims 1-5, in view of Nakada and Dietrich-Buchecker; and Claims 1-4, with respect to Daniel. Each is discussed separately.

With respect to the Nakada reference, Claim 1 was amended to specify the R<sup>1</sup> group as a substituted phenyl and substituted biphenyl having at least one substituent selected from F, C<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, OC<sub>n</sub>H<sub>a</sub>F<sub>b</sub>, C<sub>6</sub>H<sub>c</sub>F<sub>d</sub>, and OC<sub>6</sub>H<sub>c</sub>F<sub>d</sub>. Such compounds are not disclosed or suggested by Nakada. The inserted subject matter is that which is now canceled Claim 4. Claim 5 has been rewritten in independent from. Thus, this rejection should be withdrawn.

With respect to the Dietrich-Buchecker article, Applicants respectfully traverse this rejection with respect to the compound disclosed on page 3396 and cited by the Examiner in the Office Communication, dated May 5, 2004, at page 4, paragraph 7, penultimate line. In particular, only the Dietrich-Buchecker compound 2b and 4b, when X = F, was within the scope of the originally filed claims. Claim 1 has been amended accordingly to recite only the other patentably distinct species. *Accord* Appln. No. 10/612,493 at page 5, lines 37 to page 6, line 2, and Figures 3B through 3F. Claim 5 has been rewritten in independent form and does not recite the compounds of the Dietrich-Buchecker article.

With respect to the Daniel reference, Applicants respectfully suggest that the Examiner has mis-read the reference. In particular, the phenanthroline compositions of Daniels at neither column 7, line 13-19, nor Daniel's claims 1-9, anticipate the previously pending claims or the currently amended claims in that none have a fluorine containing substituent corresponding to R<sup>1</sup> as presently proposed in amended Claim 1.

Applicants request that the 35 U.S.C. § 102(b) be withdrawn.

**Conclusion**

In view of the foregoing amendments and remarks, Applicants respectfully submit that the above referenced application is in condition for allowance and a notice of allowance is earnestly requested.

Respectfully submitted,



**MARY-ANN CAPRIA**  
ATTORNEY FOR APPLICANTS

Registration No.: 32,659

Telephone: (302) 992-3749

Facsimile: (302) 892-7949

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*The*  
*Condensed Chemical*  
*Dictionary*

SEVENTH EDITION

*Completely revised and enlarged by*  
*ARTHUR and ELIZABETH ROSE*  
*State College, Pa.*

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END PAPER (FRONT): Styrene Plant of Monsanto Corp., Texas City  
END PAPER (REAR): Catalytic Reforming Unit of Gulf Oil Co., Port Arthur, Tex.

**alkavervir.** Mixture of alkaloids obtained by selective extraction of *Veratrum viride* with various organic solvents and selective precipitation from acidic and basic solutions.

**Properties:** Light yellow powder, which provokes sneezing. Freely soluble in alcohol and acetone; practically insoluble in water.

**Use:** Medicine.

**"Alkazene"** 42,233 Trademark for ar-dibromoethylbenzene. ( $C_6H_4C_2H_4Br_2$ ). Colorless liquid, f.p.  $-40^\circ C$ ; b.p.  $262^\circ C$ ; sp. gr. 1.744; refractive index 1.587 at  $25^\circ C$ ; 14.51 lb/gal at  $25^\circ C$ . Insoluble in water; soluble in methanol and ether. Used in the synthesis of pharmaceuticals, dyes, quaternary ammonium compounds and other organic compounds.

**"Alkeran."** 301 Trademark for melphalan.

**"Alkolene."** 244 Trademark for series of slightly alkaline oils emulsified with soap. Used in the leather industry.

**"Alkophos."** 48 Trademark for aluminum acid phosphates in liquid form.

**Uses:** High-temperature water-insoluble binder, coating, or adhesive.

**"Alkor."** 41 Trademark for a synthetic, furan-type resin cement which is acid- and alkali-proof and used as a mortar cement where temperatures do not exceed  $380^\circ F$ .

**"Alkron"** 100,88 Trademark for ethyl parathion in various forms. See parathion.

**"Alk-Tri."** 232 Trademark for a grade of trichloroethylene for specific industrial applications.

**"Alkydal."** 470 Trademark for alkyd resins of all kinds.

**alkyd resins.** In general, resins made by the union of dibasic acids or anhydrides, usually phthalic anhydride, with a polyhydric alcohol such as glycerol. They are a kind of polyester resin, and there is some confusion of the two names. Alkyd resins are varied and modified by the use of other anhydrides (maleic), dibasic acids, glycols, polyols or other substances, the most common of which are various natural oils or acids derived from them. Use of linseed oil or linoleic acid or similar drying oil materials produces an oxidizing alkyd, while use of essentially saturated oils and their derivatives produces nonoxidizing types. Hard resin types are produced by using rosin or similar resins as modifying agents. The alkyls' retention of initial appearance after long exposure to severe weather, heat resistance, color retention, roughness, adhesion, flexibility, and ease of application, explain the extensive uses. They can be made to close specifications of viscosity, acid number and color.

**Uses:** Protective and decorative coatings for metals, wood, paper, textiles; in adhesives, priming inks, rubber compounding, floor coverings; as vehicles in architectural, automotive, and industrial finishes; oil and water paints, lacquers, enamels.

**alkyl.** A paraffin hydrocarbon radical which may be represented as derived from an alkane by dropping one hydrogen from the formula. Examples are ethyl,  $C_2H_5$ ; propyl,  $CH_3CH_2CH_2$ ; isopropyl,  $(CH_3)_2CH$ ; etc. Corresponding aromatic radicals are known as aryl.

**alkylaryl polyethyleneglycol ethers.** See isocetylphenoxypolyoxyethylene ethanol for a typical example of this class of compound. They are used as surface-active agents, as in detergents.

**alkylaryl sulfonates.** A more general name for alkylbenzene sulfonates (q.v.).

**alkylate.** Generic term, particularly in the oil industry, applied to the product of an alkylation process. (See "Alkylation Process, HF," alkylation process, sulfuric acid.) Alkylate generally is blended in varying proportions with other hydrocarbon mixtures also boiling in the gasoline boiling range to produce military and civilian aviation gasolines and motor fuels of commerce. (See also detergent alkylate.)

**alkylate benzene sulfonates.** See alkylbenzene sulfonates.

**"Alkylation Process, HF."** 416 Patented process employing virtually anhydrous liquid hydrogen fluoride as catalyst in combining an isoparaffin with an olefin to produce an alkylate product composed of the corresponding branched-chain paraffins. (For example, isobutane combines with ethylene to give 2,2-dimethylbutane.) Used extensively by oil industry to produce very high octane gasoline blending component, usually from isobutane and butylenes (sometimes the olefin is a  $C_3$ - $C_4$  mixture, less frequently propylene only or amylene only), the alkylate being a mixture of branched-chain paraffins, generally octanes. Apparatus for continuous catalyst regeneration is part of process equipment.

**alkylation process, sulfuric acid.** Sulfuric acid also is used as an alkylation catalyst. It requires a considerably different and more complex arrangement of apparatus than hydrogen fluoride alkylation, since refrigeration is required. Spent acid (88-92%  $H_2SO_4$ ) must be continuously withdrawn for reconstitution in a separate acid plant and make-up acid (98%  $H_2SO_4$ ) added.

**alkylbenzene sulfonates (alkylate benzene sulfonates; ABS).** Commonly the dodecylbenzene or tridecylbenzene sulfonates. These sulfonates have had the biggest sale of all the synthetic detergents until recent concern over biodegradability (q.v.). Although the name alkyl could mean either a straight-chain or branched-chain radical, the ABS compounds have in the past been branched-chain, due to their method of manufacture, and the name is now used for branched-chain sulfonates, which are called hard because of their resistance to biodegradation. For soft (straight-chain) sulfonate compounds, see linear alkyl sulfonates (LAS). See also detergents, synthetic; sodium dodecylbenzene sulfonate, as typical of ABS.

**alkyl dimethylbenzylammonium chloride.** General name for typical quaternary detergent. See, for example, benzalkonium chloride.

**alkyl fluorophosphate.** See diisopropyl fluorophosphate.

**alkylolamines.** See alkanolamines.

**alkyne.** Systematic name for acetylene hydrocarbons. Examples: acetylene  $HC\equiv CH$ ; propyne  $CH_3C\equiv CH$ .

**allantoin (glyoxyldiureide; 5-ureidohydantoin)**  $C_4H_6N_4O_3$ . The end product of purine metabolism in mammals other than man and other primates; it results from the oxidation of uric acid.

\*See "Shipping Regulations," page xv.

Reference numbers refer to name of manufacturer. See "List of Manufacturers," page v.

- class B. Poison label. Legal label name: arsenic sulfide.<sup>9</sup>
- arsenic white. See arsenic trioxide.
- arsenic yellow. See arsenic trisulfide (pigment); orpiment.
- arsenious acid. See arsenic trioxide.
- arsenious anhydride. See arsenic trioxide.
- arsenious bromide. See arsenic tribromide.
- arsenious chloride. See arsenic trichloride.
- arsenious iodide. See arsenic triiodide.
- arsenious oxide. See arsenic trioxide.
- arsenious sulfide. See arsenic trisulfide.
- arseniuretted hydrogen. See arsine.
- arsenobenzene. See arspicnamine.
- "Arsenous-S." 400 Brand name for arsenic thioarsenate.
- arsenopyrite (mispickel; arsenical pyrites)  $\text{FeS}_2 \cdot \text{FeAs}_2$ .  
Properties: Silver-white to gray mineral. It sometimes is highly auriferous. Soluble in nitric acid. Sp. gr. 5.89 to 6.2; hardness 5.5 to 6.0.  
Occurrence: United States (California, Alaska); Canada; Brazil; Australia; Bolivia; England; Germany.  
Uses: Ore of arsenic and gold.
- arsenosobenzene (phenyl arsenoxide)  $\text{C}_6\text{H}_5\text{AsO}$ .  
Use: Veterinary medicine.
- arsenous anhydride. See arsenic trioxide.
- arsenous bromide. See arsenic tribromide.
- arsenous chloride. See arsenic trichloride.
- arsenous iodide. See arsenic triiodide.
- arsenous oxide. See arsenic trioxide.
- arsenous sulfide. See arsenic trisulfide.
- arsenous sulfide, yellow. See arsenic trisulfide.
- arsine (arsenic hydride; arseniuretted hydrogen)  $\text{AsH}_3$ .  
Properties: Colorless gas; extremely poisonous! M.p.  $-113.5^\circ$ ; b.p.  $-55^\circ\text{C}$ ; decomposes  $230^\circ\text{C}$ ; soluble in water; slightly soluble in alcohol, alkalies.  
Derivation: By the action of sulfuric acid on metallic zinc mixed with arsenic compounds.  
Grades: Technical; 99% pure or in mixture with other gases.  
Containers: Steel cylinders.  
Use: Organic synthesis; military poison gas; pure gas as a doping agent for solid state electronic components.  
Shipping regulations: Consult regulating authorities.<sup>9</sup>
- arsphenamine (3,3'-diamino-4,4'-dihydroxyarsenobenzene dihydrochloride; arsenobenzene; 606; Ehrlich 606). Originally patented as "Salvarsan."  
 $\text{NH}_2(\text{OH})\text{C}_6\text{H}_3\text{AsAsC}_6\text{H}_3(\text{OH})\text{NH}_2 \cdot 2\text{HCl} \cdot 2\text{H}_2\text{O}$ .  
Properties: Light yellow, hygroscopic, poisonous powder; odorless or slight odor. Contains not less than 30% arsenic. Oxidized by exposure to air, it becomes more toxic and darker. Soluble in water, alcohol, glycerol and sodium hydroxide solution; slightly soluble in chloroform and ether.  
Derivation: By reducing 3-nitro-4-hydroxyphenyl-arsonic acid with sodium hydrosulfite.  
Containers: Ampules; sealed glass tubes.  
Use: Medicine; veterinary medicine.
- arsthol  $\text{C}_{11}\text{H}_{13}\text{NO}_7\text{S}_2\text{As}$ . Cyclic 3-hydroxypropylene ester of 3-acetamido-4-hydroxydithiobenzene-*o*-arsinous acid; 2-(3'-acetamido-4'-hydroxyphenyl)-1,3-dithia-2-ursacyclopentane-4-methanol.  
Properties: White, odorless, microcrystalline powder; sparingly soluble in alcohol; very slightly soluble in water.  
Use: Medicine.
- "Artane" Hydrochloride. 212 Trademark for trihexyphenidyl hydrochloride [3-(1-piperidyl)-1-phenyl-1-cyclohexyl-1-propanol hydrochloride]  
 $\text{C}_{20}\text{H}_{31}\text{NO} \cdot \text{HCl}$ .
- artemisia absinthium oil. See wormwood oil.
- arterenol. See levarterenol.
- "Artic." 28 Trademark for refrigeration grade of methyl chloride.
- artificial cinnabar. See mercuric sulfide, red.
- artificial gum. See dextrin.
- artificial oil of neroli. See methyl anthranilate.
- "Arubren CP." 470 Trademark for a highly chlorinated aliphatic hydrocarbon compound used in rubber compounds to decrease or prevent the inflammability of vulcanizates.
- aryl compounds. Those whose molecules have the ring structure characteristic of benzene, naphthalene, phenanthrene, anthracene, etc., i.e., either the six-carbon ring of benzene or the condensed six-carbon rings of the other aromatic derivatives. For example, an aryl radical might be phenyl,  $\text{C}_6\text{H}_5$ ; benzyl,  $\text{C}_6\text{H}_5\text{CH}_2$ ; naphthyl,  $\text{C}_{10}\text{H}_7$ ; etc.
- "Arzene." 47 Trademark for arsenosobenzene.
- As Symbol for arsenic.
- as-. Abbreviation for asymmetrical; same as uns- (q.v.).
- "ASA." 100 Trademark for acetylsalicylic acid, U.S.P.
- "ASA." 243 Brand name for a proprietary antiskinning agent.  
Properties: Water-white to pale straw liquid, containing 100% active ingredient; sp. gr. ( $80^\circ\text{F}$ ) 0.908; flash point  $66^\circ\text{C}$  (Cleveland open cup).
- A.S.A. Abbreviation for American Standards Association, which publishes and acts as a clearinghouse on standards of all kinds.
- asafetida oil.  
Properties: Colorless to yellow or brown essential oil. Disagreeable odor suggestive of onions or garlic. Soluble in alcohol, ether, chloroform, benzene.  
Constants: Sp. gr. 0.915-0.993 at  $15.5^\circ\text{C}$ ; optical rotation  $+10^\circ 58'$  to  $-17^\circ 3'$ ; refractive index 1.4942-1.5259; sulfur content 8.9-31.4%.  
Derivation: By distillation of gum asafetida.
- asarone. See 2,4,5-trimethoxy-1-propenylbenzene.
- asarum canadense oil (Canada snake root oil; wild ginger oil; Canadian asarabacca oil).  
Properties: Yellowish-brown volatile oil; agreeable, strong aromatic odor and taste; soluble in 70-80% alcohol.  
Chief known constituents: Linalool; pinene; borneol; terpineol; geraniol; methyl eugenol.  
Derivation: Distilled from the rhizome and roots of *Asarum canadense*.  
Use: Perfumery.
- asbestos (amphibole; chrysotile; serpentinite). A group of impure magnesium silicate minerals which occur in fibrous form.

<sup>9</sup>See "Shipping Regulations," page xv.

Reference numbers refer to name of manufacturer. See "List of Manufacturers," page v.

railways, canals and roadways. The selective herbicides are generally organic compounds which kill only selected species in relation to the general plant life in the area. Recent developments, especially with means of removal of broadleaf weeds from cereal crops, has expanded the demand for the materials about the home and on the farm. The prime development came with the application of the aryloxy and related compounds; e.g., 2,4-dichlorophenoxyacetic acid (2,4-D); and developments of other selective herbicides such as the carbamates and urea derivatives; chlorinated acids and phenols; dinitro compounds and many others. The compounds generally function as plant hormones and disturb the physiological processes of the susceptible plants. See also plant growth regulators.

**"Herco" Blasting Agent 1.** <sup>288</sup> Trademark for a blasting agent of high-density premixed nitrocarbonitrates. Used for pouring into boreholes at blasting operations where conditions are not too severe.

**"Hercollat."** <sup>289</sup> Trademark for a polypropylene texturing agent.

**"Hercoflex."** <sup>290</sup> Plasticizers. <sup>290</sup> Trademark for a line of plasticizers.

150. Di(n-octyl, n-decyl) phthalate.

290. Di(n-octyl, n-decyl) adipate.

600. High-boiling ester of pentaerythritol and a saturated aliphatic acid.

707. High molecular weight polyol ester. Used in high-temperature vinyl electrical insulation.

900. High molecular weight polyester plasticizer for polyvinyl acetate.

J15. Saturated aliphatic ester of pentaerythritol for plasticizing vinylidene chloride.

**"Hercogel"-A.** <sup>291</sup> Trademark for a water-resistant, plastic, ammonia gelatin. A permissible dynamite used under the most severe water conditions.

**"Hercolube"** Synthetic Lubricants. <sup>292</sup> Trademark for synthetic lubricant base stocks derived from pentaerythritol esters of saturated fatty acids.

**"Hercolyn"** D. <sup>293</sup> Trademark for a pale, viscous liquid, the hydrogenated methyl ester of rosin. Used as a plasticizing resin.

**"Hercomix"** 1. <sup>294</sup> Trademark for premixed, prill- and fuel-oil nitrocarbonitrates blasting agents. Used where water conditions are not too severe.

**"Herco" Pine Oil.** <sup>295</sup> Trademark for high-quality pine oil; predominantly secondary and tertiary cyclic terpene alcohols.

Properties: Total terpene alcohols 85%; colorless to pale yellow liquid; sp. gr. 0.934 at 15.6/15.6°C. ASTM distillation range 5-95%; 205-220°C.

**"Herculoid"** Nitrocellulose. <sup>296</sup> Trademark for nitrocellulose containing 10.9 to 11.2% nitrogen. Used for pyroxylin plastics.

**"Herculon."** <sup>297</sup> Trademark for polypropylene olefin fibers. Available in bulked continuous and continuous multifilament yarns, staple, and uncut tow. Uses: Apparel, home furnishings, and industrial applications.

**"Hercrol."** <sup>298</sup> Trademark for synthetic rubber products, especially butadiene-acrylonitrile rubber, and including sheet lining, molded products, uncom-

pounded synthetic rubber and rubber coating, self-curing or baking.

**"Heresite."** <sup>299</sup> Trademark for a series of pure phenol-formaldehyde resinous coatings and related products of the thermosetting type. Applied by spraying, dipping, or roller-coating, followed by curing at temperatures of approximately 400°F.

Uses: Anticorrosive lining for shipping containers, machinery and equipment for chemicals, food, drug, and petroleum industries. Lining of tank cars for transporting sulfuric acid and other corrosive chemicals.

**herold.** See diacetylmorphine.

**"Herex."** <sup>300</sup> Trademark for nylon filaments, used in brushes.

**herring oil.**

Properties: Pale yellow to dark red liquid. Soluble in ether, chloroform, solvent naphtha and carbon disulfide. Sp. gr. 0.9202-0.932; saponification value 179-194; iodine value 130-142; refractive index 1.478.

Derivation: By boiling and pressing herring.

Uses: Soap; leather dressing; currying and finishing; lubricating special machinery.

**hesperidin**  $C_{28}H_{34}O_{16}$ . A naturally occurring product, a bioflavonoid, related to rutin.

Properties: Fine needles. M.p. 258-262°C; soluble in dilute alkalies, pyridine; very slightly soluble in water, acetone, benzene, and chloroform.

Derivation: Extraction from orange peel or other citrus fruits.

Uses: Medicine; food supplement. Usually administered as the methyl chalcone. See next entry.

**hesperidin methyl chalcone.** A bioflavonoid. Produced by methylation of hesperidin in an alkaline solution.

Uses: Medicine; food supplements.

**Hess's law.** The heat evolved or absorbed in a chemical process is the same whether the process takes place in one or in several steps; also known as the law of constant heat summation.

**"Her"** Acid. <sup>301</sup> Trademark for chlorendic acid.

**hetero-** A prefix meaning other or different. For example, heterocyclic refers to compounds in which more than one kind of atom is joined in a ring, as in pyridine.

**heterogeneous reactor.** See nuclear reactor.

**heteromolybdates (heteropolymolybdates).** A large group of complex molybdenum salts and acids in which the anion contains oxygen atoms and from two to eighteen hexavalent molybdenum atoms as well as one or more other metal or nonmetal atoms such as phosphorus, arsenic, iron and tellurium. The latter are referred to as hetero atoms and any one of about 35 elements may be present in this manner. Example:  $Na_3PMo_{12}O_{40}$ , sodium phospho-12-molybdate.

Properties: The molecular weights of these compounds range up to 3000. The acids and most of the salts are very soluble in water, and the acids and some salts are soluble in organic solvents such as ethers, alcohols and ketones. Salts of metals of high atomic weight (cesium, silver, mercury, lead) are of low solubility in water, and a few alkali metal

<sup>288</sup>See "Shipping Regulations," page xv.

Reference numbers refer to name of manufacturer. See "List of Manufacturers," page v.



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